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FINANCIAL TECHNOLOGY (FINTECH) AND DEPOSIT MONEY BANKS PERFORMANCE IN NIGERIA

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***Abstract*:** *This study examined the effect of FinTech on the performance of DMBs in Nigeria between the periods of 2016q-2023q. The objectives of the study were to determine the effect of FinTech generated volume of transactions (ATM, Mobile banking Web/Internet, and Point of Sale) on return on assets of Deposit Money Banks in Nigeria. The data used were resourced from Central Bank of Nigeria (CBN) Statistical Bulletin 2023. The variables were the return on asset as the dependent variable, while ATM, Mobile banking Web/Internet, and Point of Sale as the independent variables. The study employed unit root test, to determine the stationarity of the variables, ARDL co-integration approach to determine the long run equilibrium relationship of the variables and regression result. From the model it was conclude that financial technology has a positive significant effect on the performance of deposit money banks. The study found that Current and lagged values of number of transactions on ATMs, mobile phones, online banking, and point-of-sale systems were significant predictors of return on assets of DMBs in Nigeria. The study also showed that variations in return on assets of deposit money banks were significantly explained by joint influences of the selected FinTech variables (volume of transactions on ATMs, mobile banking, online banking, and point of sale systems). The study recommends that deposit money banks should ensure adequacy of FinTech services, regardless of location to enhance customer access.*

Keywords: *ATM, Mobile banking Web/Internet, Point of Sale and FinTech*

1.1 Introduction

Financial technology (FinTech) is a generic term used to describe software, mobile applications and other technologies developed to improve and automate delivery and use of financial services. It is described by Dorfletner, Hornuf, Schmitt and Weber (2017) as the modernization of financial services via innovative technology by companies or their representatives. Financial technology (FinTech) is a technical financial tool that has led to new innovations in business models, applications and products. According to Cheng, Maoyong, and Yang Qu (2020) FinTech is an evolution in financial services that has led to changes in customer expectations and financing methods. It works by deploying innovations and improvements in ICT in the development and creation of new flexible,

fast, and cost-effective financial products and services. The adoption of technology in delivering the activities of financial institutions has rendered the operation of these institutions seamless.

Until recently, the financial sector remained largely slow technologically especially in less developed economies like Nigeria. This has changed with the emergence of FinTech firms. Fintech uses technology to provide different financial solutions such as banking, payments, and personal financial management. Financial development theory put forward by Sussman, and Repullo (2011) posit that financial technology enables each bank become more specialized, and thus efficient, and the industry becomes more competitive. However, it showed that the income is lower in high-income countries relative to low-income countries.

When opposed to service offerings from the pre-ICT era, financial technology corporations seek to draw clients with automated, efficient, transparent, and user-friendly goods and services (Dorfleitner, Hornuf, Schmitt, & Weber, 2017). Modern financial technology is centered on a number of breakthroughs, such as peer-to-peer lending, equity crowd funding, digital advice and trading platforms, peer-to-peer lending, the Block-Chain, and artificial intelligence and machine learning. Financial technology improves banking operations in a number of ways, including greater profitability and market share, client convenience, quick service delivery, and more (FinTech Weekly, 2016). Financial technology being used in banking has transformed payment processes, enhanced automated check clearing and truncation, and increased foreign remittance inflow. It makes it easier to reduce the risk involved with cash transactions. Global supply of financial services powered by technology is inevitable in the field of development finance, particularly with the growing popularity of cashless transactions. (Okoye, Adetiloye, Erin, & Modebe, 2017).

These benefit oriented features encourage customers to embrace electronic banking services (Akhisar, Tuna &Tunay, (2015); Increasing demand for such services has led banks to shift a significant portion of their investments to this area. Technology-based products offer significant advantages to users and bank service providers in the area of cost saving, profitability, risk- reduction as against the traditional banking products. (Tunay, Yuksel. & Tunay, 2019). In addition, studies like (Oyedokun, Orenuga, Adeolu-Akande, (2021); Hafez, Kaddumi, Nassar, and Muqattash, (2023) have shown that the payback period of investments by banks in this area is considerably shorter due to high customer demand for technology-based products. The challenge that FinTech firms face in the modern banking environment is that they compete with those offered by traditional banks in terms of speed of delivery and convenience. Technology powered banking operations demonstrate obvious advantages in the areas of speed of delivery, speed of banking, and affordability particularly with credit delivery. In addition, Pierrakis and Collins (2013) wrote: "such innovations not only disrupt existing industry structures and blur industry boundaries, facilitate strategic disintermediation, revolutionize how existing firms create and deliver products and services, provide new gateways for entrepreneurship, democratize access to financial services, but also create significant privacy, regulatory and law enforcement challenges". These changes have brought about some gains as well as challenges in the area of credit delivery functions, marketing strategies, managerial decision making process, access to greater number of clients, and reaching the less banked or even unbanked people around the country.

1.2 Objectives of the Study

The main objective of this study is to examine the effect of FinTech on the performance of DMBs in Nigeria. The specific objectives are to:

1 Determine the effect of FinTech generated volume of transactions (ATM, Mobile banking Web/Internet, and Point of Sale) on return on assets of Deposit Money Banks in Nigeria.

REVIEW OF RELATED LITERATURE

2.1 Conceptual Review

2.1.1 Financial Technology (FinTech)

FinTech is a cross-disciplinary subject that combines finance, technology management and innovation management (Leong & Sung, 2018).Financial technology is referred to as fintech and is a commercial and banking entity. In the financial services industry, technology is employed in a variety of ways, such as mobile payments, money transfers, loans, fundraising, and asset and property management. Given that Fintech is not only connected to the financial services industry but also all businesses that deal with it, and that Fintech startups are typically astute and capable of causing disruption, Fintech investment has increased dramatically recently and is expected to do so going forward. Fintech is described as those products and services that rely on technology to improve the quality of traditional financial services.They are simple and quick. Most of the time, these services and goods are created by young businesses that aim to outperform established financial service providers in the retail and corporate banking markets. The current collaboration between banks and financial technology businesses is advantageous to both parties (Almomani & Alomari, 2021).

2.2 Theoretical Framework

Diffusion of Innovation Theory by Rogers 1962

Diffusion of innovations is a hypothesis that aims to explain how, why, and at what pace new ideas and technologies spread through civilizations. It was first proposed by Rogers in 1962. He explains that relative benefit, compatibility, complexity, trial-ability, and observability are important characteristics that impact an innovation's general adoption. Benefits to consumers that have been documented in relation to FinTech adoption include affordability, convenience, and immediate gratification. Thus, it is assumed that, when customers perceive distinct advantages offered by FinTech, they are more likely to adopt it (Wasilwa & Omwenga, 2016). According to Wasilwa and Omwenga (2016), compatibility is the degree to which a service is thought to be consistent with users' current values, beliefs, habits, and experiences, both past and present. Compatibility is an important feature of innovation as conformance with user's lifestyle can propel a rapid rate of adoption. Observability of an innovation describes the extent to which an innovation is visible to the members of a social system, and the benefits can be easily observed and communicated. According to Rogers, trial-ability is defined as the capacity to experiment with new technology before adoption. Potential adopters who are allowed to experiment with an innovation will feel more comfortable with it and are more likely to adopt it. Perceived risk refers to the degree of risks in using an innovation.

2.3 Empirical Literature

In 2015, Ngango conducted an investigation into the impact of E-banking on the performance of banking institutions in Rwanda. The National Bank of Rwanda reported that there were frequently fraud-related cases, errors resulting from manual work, and delays in check payments between banks. Because of the aforementioned complaints from certain clientele, the researcher would like to investigate how this system affects Rwandan banking efficiency. To obtain a more thorough analysis of the study, the researcher employed a descriptive technique of study based on a qualitative and quantitative approach. In order to obtain the necessary data, he will employ both primary and secondary data gathering methods along with pertinent tools like questionnaires and documentary analysis. According to the findings, electronic banking systems such as pay direct, ATMs, electronic check conversion, mobile banking, and e-transact have a significant impact on the performance of banks because they raise asset values, lower operating costs, and improve profitability.

Sindwani and Goel (2012) examined a number of significant research carried out in different nations to determine the parameters of the quality of ATM banking services. Review results indicate that researchers cannot agree on any aspect of the quality of ATM banking services. The study makes the need for more investigation in order to create a widely used scale for evaluating the quality of ATM banking services based on standard dimensions.

Ahmed and Wamugo (2018) looked into how Kenyan commercial banks performed in relation to financial innovation. The research design used in the study was descriptive. The 16 commercial banks in Kenya that have adopted all of the financial innovations under investigation were the focus of the study. The study made use of secondary data from Central Bank of Kenya Bank Supervision reports as well as primary data gathered through structured questionnaires given to senior management staff members. The quantitative data were described using descriptive statistics. The associations between the study variables were determined using multiple regression analysis, analysis of variance, and Pearson's correlation. The study found that agency, mobile, internet, and ATM banking had a statistically significant favorable impact on Kenya's commercial banks' performance.

The impact of electronic banking on the operations of DMBs (DMBs) in Nigeria was examined by Gbanador, M. A. (2023) using secondary data on monthly time series from 2019 to 2021 that was obtained from the Central Bank of Nigeria's statistical bulletin and analyzing the data using the ordinary least square (OLS) method. The study discovered that e-banking systems had no appreciable effect on DMB performance in the short term in Nigeria. Nevertheless, the long-term analysis's conclusion showed that, in Nigeria, mobile banking has a favorable and large impact on DMBs' performance, while ATM and POS have a positive but negligible effect. The study comes to the conclusion that e-banking affects DMB performance in Nigeria and suggests that DMBS educate customers about the advantages of using POS, ATMs, and other e-payment channels in addition to providing high-quality mobile banking services in order to maintain their performance.

Ndirangu, Kiragu, Ngunyi, Shano and Kimani (2022) evaluated the effect of ATM banking on performance of the microfinance banks in Kenya. The study adopted technology acceptance model and used primary data collected administered questionnaires. Descriptive and inferential statistics were used to calculate the simple means; standard

deviations and to make conclusions from the information. Data was presented using frequency tables, and correlations table. Factor analysis was conducted to reduce the number of factors and Kaiser Meyer Olkin and Barlett's test of Sphericity were tested and total variance explained, scree plot and rotated component matrix were drawn. Model R - Square, ANOVA Statistics and regression coefficients R were used to test the hypothesis of bivariate model. The study concluded that there is a statistically significant relationship between ATM banking and performance.

Furthermore, Muluka, Kidombo, Munyolo, and Oteki (2015) investigated the effect of digital banking on customer satisfaction in Kenya. The target population for the study was bank customers and banking staff from National Bank in Bungoma County. Using a sample size of 417. Data for the study were collected using a combination questionnaires, interview and desk reviews. Analysis was undertaken with the aid of Statistical Package for Social Sciences where both descriptive and correlation analysis were performed. The findings of the study established that there was a significant relationship between speed of transaction and customer's satisfaction. Thus, banks were advised to invest more on robust reliable systems to reduce incidents of failed transactions and transactional errors in ATMs.

Atueyi, Nkechukwu, Nzotta, .& Jacobs, (2019) investigated the effect of electronic banking and performance of Small and Medium Scale Enterprises (SMSE) in Nigeria between the periods of 1981-2018. The data used were resourced from Central Bank of Nigeria (CBN) Statistical Bulletin 2018. The variables were the performance of small and medium scale enterprises as the dependent variable, while Automated Teller Machine,(ATM), Point of Sales (POS) and Mobility of Payment (MOP) as the independent variables. The study employed unit root test, to determine the stationarity of the variables, co-integration approach to determine the long run equilibrium relationship of the variables and Error Correction Model (ECM) to determine the speed of adjustment. Ordinary Least Square (OLS) method of data analysis was adopted. From the model it was conclude that electronic banking has a positive significant effect on the performance of small and medium scale enterprises. The study found that point of sales has positive significant effect on the performance of Small and Medium Scale Enterprises (SMSE) in Nigeria, Automated Teller Machine (ATM) has positive significant effect on the performance of Small and Medium Scale Enterprises (SMSE) in Nigeria.

RESEARCH METHODOLOGY

3.1 Research Design

An ex-post facto research design was used in this investigation. With the time span spanning from the first quarter of 2016 to the fourth quarter of 2023, thirty-two (32) observations were made in total. The choice of an ex-post facto research design is based on the assumption that the data cannot be altered by the authors because they are publicly accessible through reputable and controlled government organizations.

3.2 Nature and Sources of Data

The Nigeria Deposit Insurance Corporation (NDIC) Quarterly reports and the Central Bank of Nigeria (CBN) Quarterly Statistical Bulletin were the sources of the secondary data, which were collected annually.

3.3 Model Specification

This study adapted Ibenta and Anyanwu's (2017) model. According to Ibenta and Anyanwu (2017), the original model is as follows:

$$EFR = f(VTATM,\ VTWEB, VTPOS, VTMOB, MPR, CRR) \quad 1$$

Where:
EFR = Efficiency Ratio
VTATM = Value of Transaction on Automated Teller Machines
VTWEB = Value of Transaction on Web/Internet
VTPOS = Value of Transaction on Point of Sale,
VTMOB = Value of Transaction on Mobile Banking
MPR = Monetary Policy Rate
CRR = Cash Reserve Ratio

The model was modified by introducing volume of transaction on automated teller machines, mobile banking, internet banking, and point of sale terminals. Consequently, the modified models for this study are stated functionally as:

$$ROA = f(ATM,\ MBNK,\ IBNK, POS) \quad 2$$

Where:
ROA = Return on assets
ATM = Volume of transactions on automated teller machines
MBNK = Volume of transactions on mobile banking platform
IBNK = Volume of transactions on internet banking platform
POS = Volume of transactions on point of sale terminals

Econometrically transforming the model to avoid the effect of any outlier, the models are logged as follows:

Equation 1

$$LogROA_t = \beta_0 + \beta_1 LogATM_t + \beta_2 LogMBNK_t + \beta_3 LogIBNK_t + \beta_4 LogPOS_t + \varepsilon_t \ \ Equ.1$$

β_0 = a constant term
β_1, β_2, β_3 and $\beta_4$are the regression equation's coefficients.
$\boldsymbol{\varepsilon}$ = the error term
t= the time trend

The parameters B1 through B4 are expected to be larger than zero (β_1, β_2, β_3, β_4 > 0). Stated differently, the expectation was that the performance of DMBs in Nigeria would be positively correlated with the amount of FinTech transactions, as measured by the volume of transactions on ATMs, mobile, online, and point-of-sale terminals.

3.4 Hypothesis Decision Rule

A decision rule specifies when the null hypothesis (H_o) should be rejected. A very common one specifies that H_o should be rejected if the calculated value of a statistic says Z-statistic or t-statistic equal or is more positive than the positive critical value, or the value of a statistic is equal to or more negative than the negative critical value of the statistic. Thus the decision rule is that if the p-value of F-statistic in granger causality test is less than 0.05, the null hypothesis is rejected. On the other hand, if the p-value of F-statistic in granger causality test is greater than 0.05, the null hypothesis is accepted.

3.5 A Priori Expectation

It is expected that FinTech channels should have a positive relationship with performance of DMBs based on the Technology Adoption Model theory. Table 3.1 shows the supposed/expected relationship between the dependent and the independent variables.

Table 3.1: Expected Signs of Independent Variables

Symbol	Variable	Expected Signs
ATMs	Automated Teller Machine Transactions	+
MBNK	Mobile Banking Transactions	+
IBNK	Internet Banking Transactions	+
POS	Point of Sale Terminal Transactions	+

PRESENTATION AND ANALYSIS OF DATA

4.1.1 Trend in FinTech Service Channels

Automated Teller Machine (ATM)

Volume of transactions on automated teller machine has been increasing in Nigeria within the period of the study. Volume of transaction on ATMs was valued at ₦ 41,596,729 million from 2016Q_1 but increased to ₦ 75,153,374 million in 2018Q_4. With the availability of official data from the Central Bank of Nigeria, ATM volume of transactions increased from ₦ 175,510,149 million in 2020Q_1 to ₦ 82,213,816 million in 2023Q_4. Fig. 4.1 and 4.2 show the trend in volume of transactions on ATMs within the period studied.

Mobile Banking

As seen in Fig. 4.3 and 4.4, volume of mobile banking transaction was ₦5,084,892 million in 2018Q_1 but rose to ₦77,290,434 million in 2021Q_1 before it increased further to ₦ 200,682,937 million in 2022Q_1. From 2023Q_1 to 2023Q_4 volume of mobile banking transaction has been increasing with the highest mobile banking transaction occurring in 2023Q_4 with ₦532,080,549 million transaction.

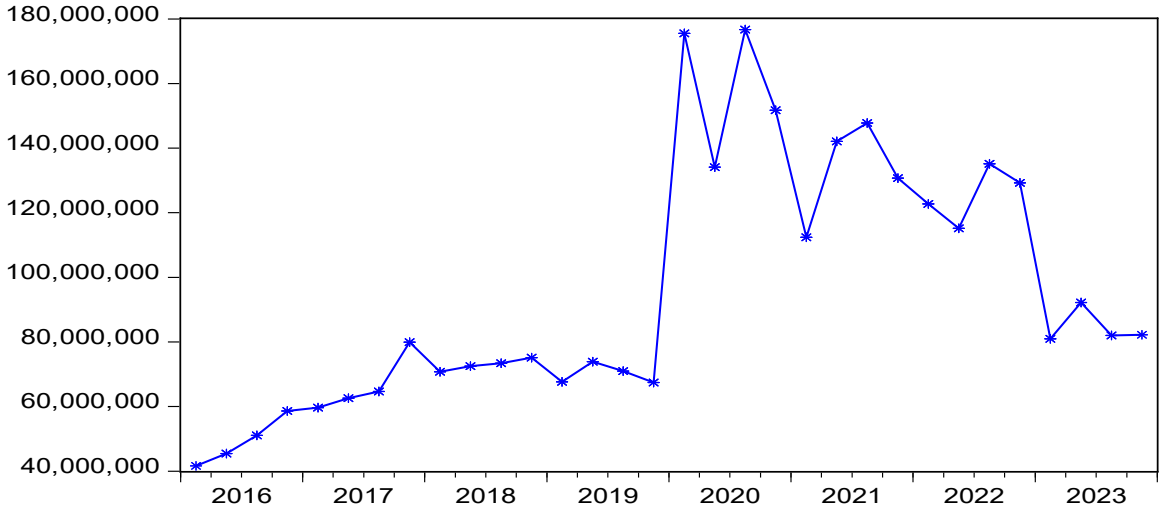

Fig. 4.1: Graphical Trend in ATM Volume of Transaction from 2016Q_1 to 2023Q_4

Source: Central Bank of Nigeria (CBN) Quarterly Statistical Bulletin; and output data from e-views 12.0

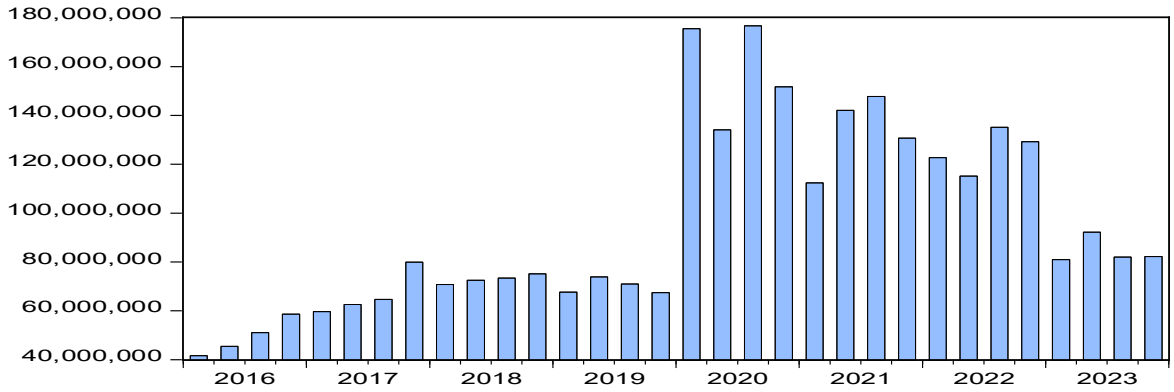

Fig. 4.2: Bar Chart Trend in ATM Volume of Transaction from 2016Q_1 to 2023Q_4
Source: Central Bank of Nigeria (CBN) Quarterly Statistical Bulletin; and output data from e-views 12.0

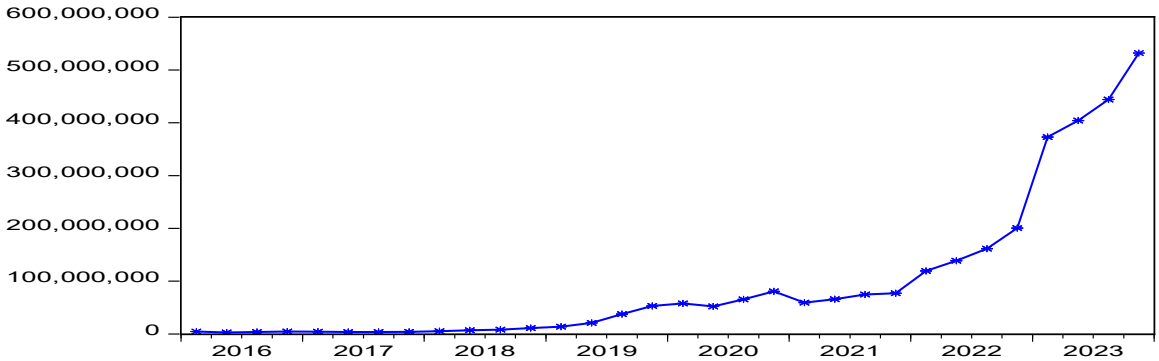

Fig. 4.3: Graphical Trend in Mobile Banking Volume of Transaction from 2016Q_1 to 2023Q_4
Source: Central Bank of Nigeria (CBN) Quarterly Statistical Bulletin; and output data from e-views 12.0

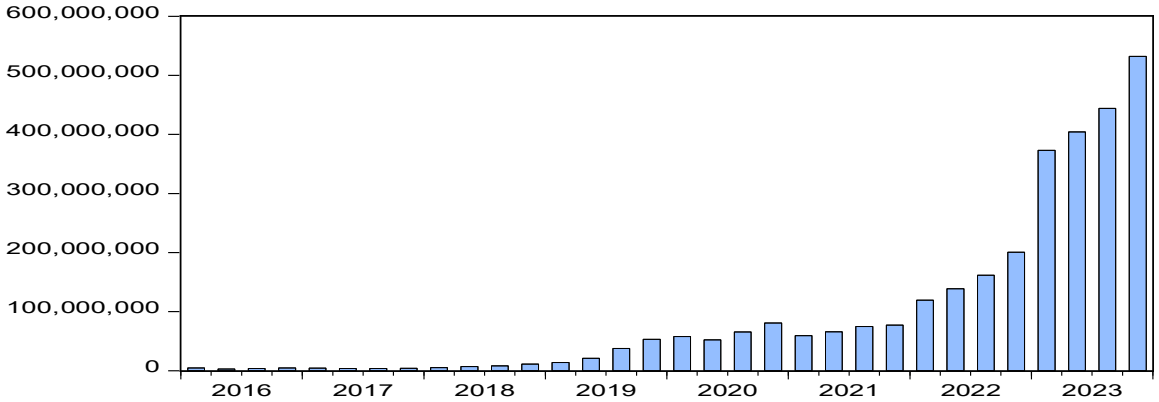

Fig. 4.4: Bar Chart Trend in Mobile Banking Volume of Transaction from 2016Q_1 to 2023Q_4
Source: Central Bank of Nigeria (CBN) Quarterly Statistical Bulletin; and output data from e-views 12.0

Table 4.1: Volume of Transactions on ATM, Mobile Banking Web/Internet, and Point of Sale of DMBs from 2016Q_1-2023Q_4

Year	Quarters	ATM (Million)	Mobile Banking (Million)	Internet Banking (Million)	POS (Million)
2016	Quarter 1	41,596,729	4,697,335	909,472	3,915,185
	Quarter 2	45,463,562	2,881,173	886,005	4,530,683
	Quarter 3	51,055,678	3,621,863	1,175,572	5,342,705
	Quarter 4	58,630,343	4,484,047	1,725,033	7,449,828
2017	Quarter 1	59,654,903	4,203,235	1,840,019	8,882,327
	Quarter 2	62,601,810	3,853,036	1,988,369	10,924,909
	Quarter 3	64,695,576	3,787,693	2,588,594	13,103,395
	Quarter 4	79,897,410	4,090,889	3,246,717	15,845,087
2018	Quarter 1	70,790,284	5,084,892	3,211,419	17,854,255
	Quarter 2	72,472,654	6,895,622	3,278,082	22,409,973
	Quarter 3	73,423,457	8,299,316	4,655,015	28,679,422
	Quarter 4	75,153,374	11,271,319	5,794,118	29,686,405
2019	Quarter 1	67,653,244	13,824,335	6,794,037	27,920,715
	Quarter 2	73,886,648	21,100,309	9,198,263	34,644,338
	Quarter 3	70,942,146	37,689,111	8,897,622	40,448,336
	Quarter 4	67,457,936	53,141,314	9,609,080	43,191,338
2020	Quarter 1	175,510,149	57,783,659	377,049,555	46,541,910
	Quarter 2	134,133,958	52,163,185	440,596,940	46,217,422
	Quarter 3	176,676,352	65,698,585	600,053,066	54,206,914
	Quarter 4	151,753,014	80,767,467	742,483,316	71,616,537
2021	Quarter 1	112,427,867	59,426,444	708,359,759	176,628,908
	Quarter 2	142,120,143	65,724,973	836,666,404	202,664,250
	Quarter 3	147,802,729	74,738,361	898,080,786	251,527,387
	Quarter 4	130,711,707	77,290,434	997,419,693	283,698,068
2022	Quarter 1	122,740,439	119,472,943	1,029,478,951.33	287,534,533
	Quarter 2	115,155,511	138,567,416	1,149,912,251.00	282,144,990
	Quarter 3	135,167,700	161,731,032	1,169,920,121.00	327,859,367
	Quarter 4	129,266,984	200,682,937	1,338,664,488.67	397,721,798
2023	Quarter 1	80,974,933	372,874,368	1,915,764,547.67	799,510,359
	Quarter 2	92,198,509	404,105,890	1,858,050,479.00	824,582,768
	Quarter 3	82,038,736	444,098,385	1,635,074,153.00	775,307,598
	Quarter 4	82,213,816	532,080,549	1,842,419,234.33	883,018,775

Source: Central Bank of Nigeria Banking Quarterly Statistical Bulletin 2023

Internet Banking

Fig. 4.5 and 4.6 showed that internet banking volume of transaction was ₦909,472 million in 2016Q_1, and by the end of 2017Q_4 it has risen to ₦3,246,717 million. It appreciated marginally from 2018Q_2 to 2018Q_4. However, it rose to ₦9,609,080 million in 2019Q_4 but from 2022Q_1 to 2023Q_4 internet banking volume of transaction increased from ₦708,359,759 million to ₦1,842,419,234.33 million.

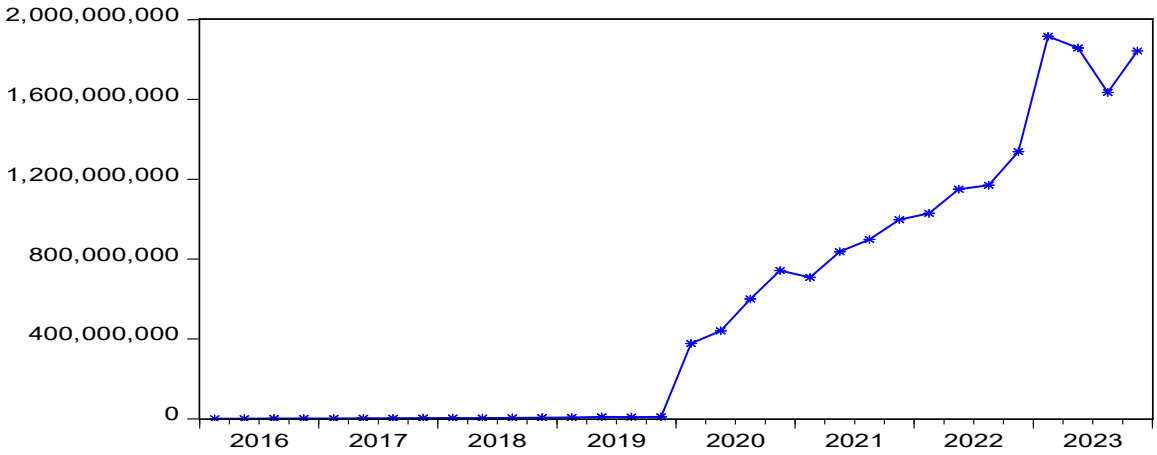

Fig. 4.5: Graphical Trend in Internet/Web Banking Volume of Transaction from 2016Q_1 to 2023Q_4
Source: Central Bank of Nigeria (CBN) Quarterly Statistical Bulletin; and output data from e-views 12.0

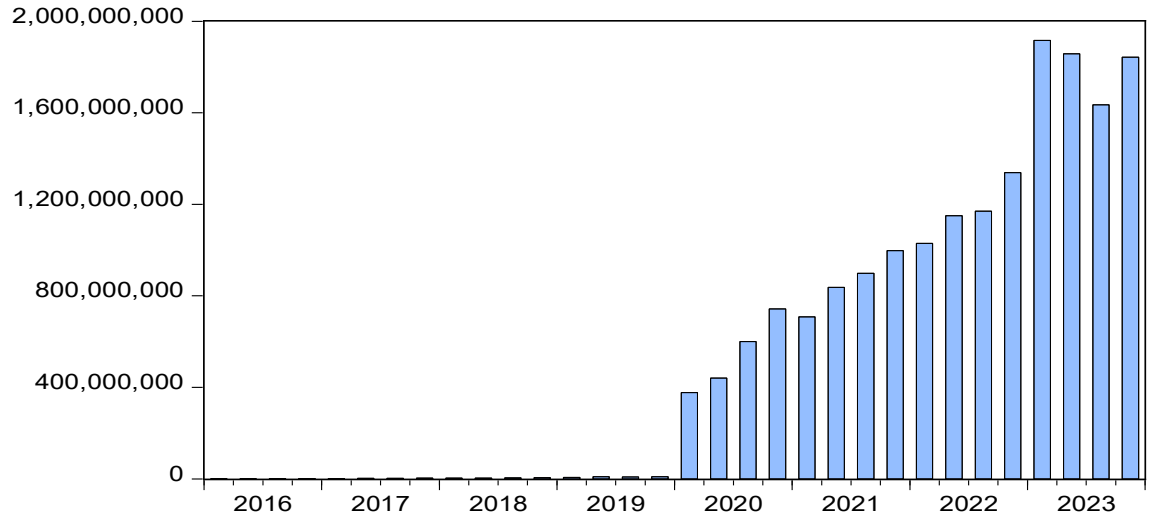

Fig. 4.6: Bar Chart Trend in Internet/Web Banking Volume of Transaction from 2016Q_1 to 2023Q_4
Source: Central Bank of Nigeria (CBN) Quarterly Statistical Bulletin; and output data from e-views 12.0

POS Transactions

Point of sale volume of transaction within the period of the study 2016Q_1 to 2022Q_1 has been on largely on the rise. It was ₦ 8,882,327 million in 2017Q_1 but rose to ₦15,845,087 million in 2017Q_4 before it increased to ₦29,686,405 million in 2019Q_4. There was a major increase in POS volume of transaction in 2022 to the tune of ₦397,721,798 million. However, it increased to ₦3,885.78 billion in 2022 Q_4. Fig. 4.7 and 4.8 provide insight to the trend in POS volume of transaction within the period studied.

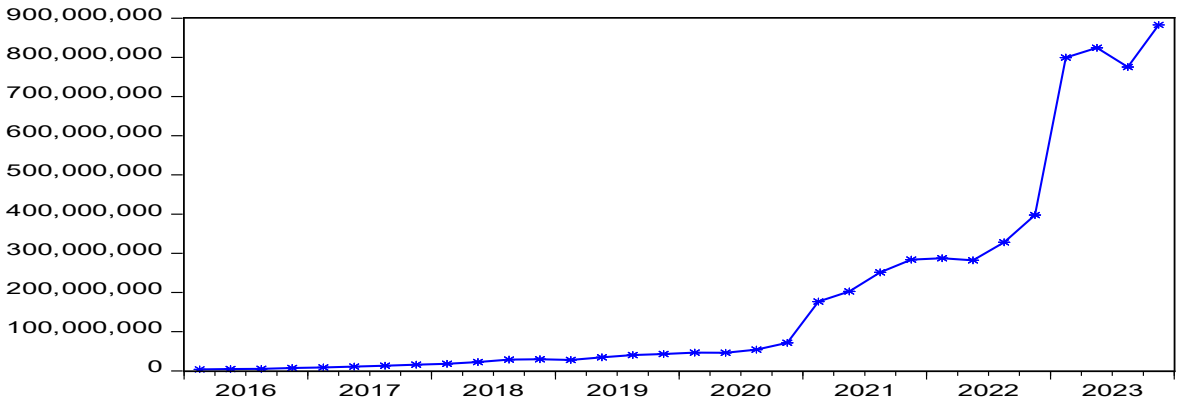

Fig. 4.7: Graphical Trend in POS Volume of Transaction from 2016Q_1 to 2023Q_4
Source: Central Bank of Nigeria (CBN) Quarterly Statistical Bulletin; and output data from e-views 12.0

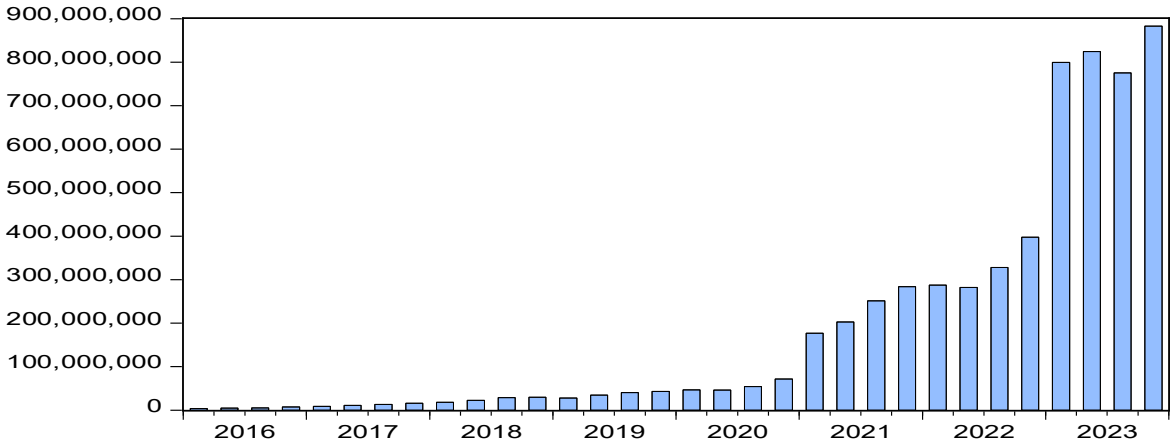

Fig. 4.8: Bar Chart Trend in POS Volume of Transaction from 2016Q_1 to 2023Q_4
Source: Central Bank of Nigeria (CBN) Quarterly Statistical Bulletin; and output data from e-views 12.0

4.1.2 Trend in Independent Variables

Return on Assets

The return on assets of DMBs in Nigeria was 15.98% in 2021Q_2 and that is the all-time high within the period studied. Return on assets of DMBs in Nigeria has the lowest figure in 2016Q_2 with -0.20% within the period of the study. From 2016Q_2 to 2023Q_4, return on assets of DMBs in Nigeria has been decreasing this might be connected to the uncertainty in Nigeria's macroeconomic environment within this period. The trend in return on assets of DMBs is dispel in Fig. 4.9 and 4.10.

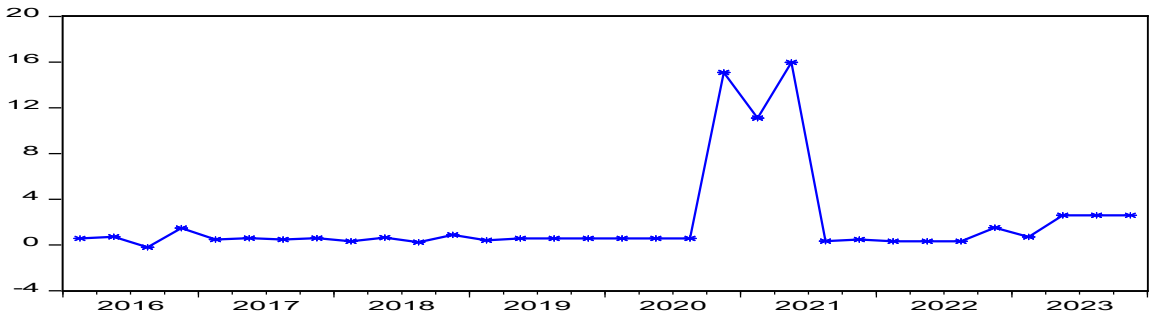

Fig. 4.9: Graphical Trend in Return on Assets from 2016Q_1 to 2023Q_4
Source: Nigeria Deposit Insurance Corporation (NDIC) Quarterly reports; and output data from e-views 12.0

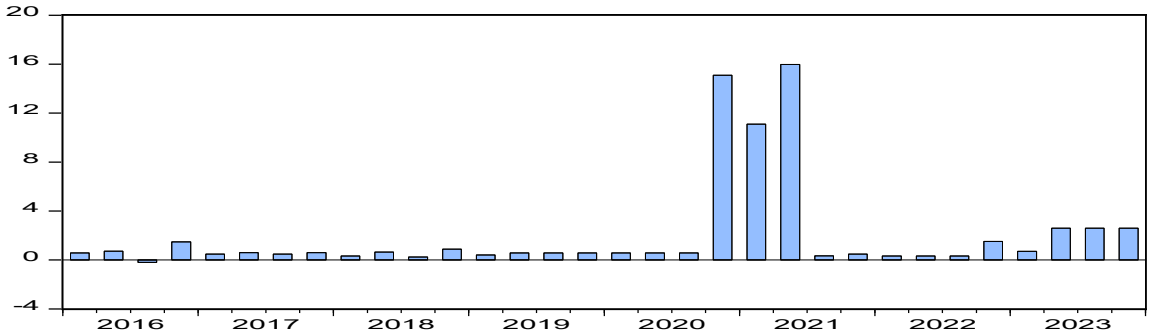

Fig. 4.10: Bar Chart Trend in Return on Assets from 2016Q_1 to 2023Q_4
Source: Nigeria Deposit Insurance Corporation (NDIC) Quarterly reports; and output data from e-views 12.0

4.2 ARDL Co-integration Relationship

The data's confirmed stationarity allowed for the examination of the potential long-term correlation between FinTech and Nigeria's DMBs' performance. The choice of the Autoregressive Distributive Lag (ARDL) estimator was based on its ability to accommodatedata set with mixed order of integration. Details regarding the outcome of the ARDL long-term partnership are presented in Tables below. Based on the ARDL result, it was determined that return on assets (ROA), is greater than the upper and lower critical values of 3.49 and 2.56, respectively.

Table 4.8: ARDL Bound Test for ROA and FinTech

T-Test	5% Critical Value Bound		Remark
F-Statistic	Lower Bound	Upper Bound	
25.40271	2.56	3.49	Null Hypothesis Accepted

4.3 ARDL Short Run Relationship

The results of the ARDL test used to estimate the relationship between FinTech and the performance of Nigeria's deposit money institutions are as presented below:

Return on Assets and FinTech

The result in Table 4.3 revealed that the performance of DMBs, as measured by ROA, was largely affected by lagged or previous values of the selected FinTech variables, except for ATM and POS which showed a significant negative effect on ROA (p = 0.0322& 0.0162). Specifically, significant improvement in ROA was influenced by ATM in lag 3 (p = 0.0193), MBNK in lags 2 and 4 (p = 0.0001 & 0.0031), IBNK in lag 3 (0.0034) and POS in lag 1 (0.0160). The implication of this result is that present values of these variables do not substantially influence the performance of DMBs in Nigeria. The result further showed that ROA had retrogressive negative effect on its current performance at lags 2 and 3 (p = 0.0043 & 0.0132) but the impact became significantly positive at the 4^{th} lag (p = 0.0101). On the other hand, the result also revealed significant negative effect of current values of MBNK (lag 1, p – value 0.0240), and IBNK (lags 1and 2, p – value 0.0291 & 0.0055), POS (lags 2and 3, p – value 0.0002 & 0.0051) on the performance of DMBs.

The R^2 (0.9988) and adjusted R^2 (0.9940) showed that the model explained over 90 percent of variations in the performance of DMBs in Nigeria, while the F-statistic of 204.99 (p – value = 0.0000) showed that the selected FinTech variables had significant joint effect on the performance of DMBs. The Durbin-Watson (D-W) statistic (2.2776) showed absence of auto-correlation in the model, an indication that the variables in the model are not serially correlated.

Table 4.13: ARDL Regression for ROA and FinTech

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA(-1)	-0.385935	0.152096	-2.537437	0.0521
ROA(-2)	-0.590338	0.119349	-4.946294	0.0043
ROA(-3)	-0.306716	0.081565	-3.760392	0.0132
ROA(-4)	0.294102	0.073053	4.025887	0.0101
ATM	-5.99E-08	2.04E-08	-2.942527	0.0322
ATM(-1)	-3.21E-08	2.02E-08	-1.588636	0.1730
ATM(-2)	2.88E-08	1.45E-08	1.981736	0.1043
ATM(-3)	5.11E-08	1.50E-08	3.396300	0.0193
ATM(-4)	4.30E-08	2.26E-08	1.905295	0.1151
MBNK	-2.69E-08	1.55E-08	-1.735718	0.1431
MBNK(-1)	-1.18E-07	3.69E-08	-3.200576	0.0240
MBNK(-2)	2.61E-07	2.26E-08	11.53437	0.0001
MBNK(-3)	2.29E-08	2.63E-08	0.870362	0.4239
MBNK(-4)	2.90E-07	5.44E-08	5.337850	0.0031
IBNK	1.07E-08	6.01E-09	1.776316	0.1358
IBNK(-1)	-1.47E-08	4.85E-09	-3.030588	0.0291
IBNK(-2)	-2.20E-08	4.72E-09	-4.668438	0.0055
IBNK(-3)	3.21E-08	6.13E-09	5.233854	0.0034
POS	-5.21E-08	1.46E-08	-3.560218	0.0162
POS(-1)	7.19E-08	2.01E-08	3.575297	0.0160
POS(-2)	-9.30E-08	9.72E-09	-9.561940	0.0002
POS(-3)	-6.84E-08	1.44E-08	-4.744865	0.0051
C	0.039908	1.498341	0.026635	0.9798
R-squared	0.998893	Mean dependent var		2.215000
Adjusted R-squared	0.994020	S.D. dependent var		4.291435
S.E. of regression	0.331871	Akaike info criterion		0.551948
Sum squared resid	0.550691	Schwarz criterion		1.646259
Log likelihood	15.27273	Hannan-Quinn criter.		0.886490
F-statistic	204.9873	Durbin-Watson stat		2.277648
Prob (F-statistic)	0.000006			

4.8 Test of Hypotheses

Hypothesis Decision Criteria: If the p-value of F-statistic from ARDL test result is less than 0.05, the null hypothesis is rejected. On the other hand, if the p-value of F-statistic from ARDL test result is less than 0.05, the null hypothesis is accepted. The choice F-statistic as the basis of hypothesis testing was because FinTech was taken its composite form. To this effect, the joint explanatory power of the independent variables, as captured in the F-statistic was used.

Hypothesis One

Restatement of Research Hypothesis

H_0: FinTech (volume of transactions on ATM, mobile banking, web/internet, and point of sale) has not significantly affected changes in return on assets of DMBs in Nigeria.

H_1: FinTech (volume of Transactions on ATM, mobile banking, web/internet, and point of sale) has significantly affected changes in return on assets of DMBs in Nigeria.

Table 4.26 unveiled that the p-value of the f-statistic for the estimated model one is significant at 5% level of significance. This suggests that FinTech (volume of Transactions on ATM, mobile banking, web/internet, and point of sale) has significantly determined the changes in return on assets of DMBs in Nigeria. In effect, the null hypothesis that FinTech (volume of Transactions on ATM, mobile banking, web/internet, and point of sale) has not significantly affected changes in return on assets of DMBs in Nigeria is rejected, while the alternate hypothesis accepted.

Table 4.26: Test of Hypothesis One

Hypothesis	Equation Estimated	F-Statistic	P-Value	Decision
Hypothesis 1	ROA → ATM + MBANK + IBNK + POS	204.9873	0.000006	RejectH_0 &Accept H_1

Discussion of Findings

From the results presented in the preceding section, it was observed that return on equity, profit before taxes, net interest income, and FinTech variables (the volume of transactions on ATMs, mobile devices, internet/web banking, and point of sale systems) have a long-term correlation with each other. In addition, the study revealed that FinTech as a composite variable and in its disaggregated form (as used in the study) contributed to performance enhancement in DMBs in Nigeria. These suggests that when deposit money institutions consciously increase their use of FinTech channels, the result will likely be a rise in the banks' performance indicators In relation to the nexus of FinTech and bank performance the present study found significant positive effect of FinTech on performance of DMBs in Nigeria. This outcome is consistent with the findings in Okafor (2020), Islam et al (2022), Hu et al (2019), Courtney (2016), Okon and Amaegberi (2018), Kibor and Kimani (2019), Demaki et al (2021), Ejike (2019), Mutua (2017), Daniyan-Baniyan et al (2017), Sidik et al (2016), to mention just a few.

CONCLUSION AND RECOMMENDATIONS

Following from the findings of the study, it is concluded that within the scope of this research, FinTech variables (volume of transactions on ATM, internet banking, and POS) have significant effect on the performance of DMBs in Nigeria, and that the models developed to determine the nexus of FinTech and performance of DMBs in Nigeria is adequate. The study recommends that Deposit money banks should ensure adequacy of FinTech services, regardless of location to enhance customer access.They should also ensure availability of FinTech services so that customers can have seamless and round-the-clock access. Adequacy and availability of FinTech services are essential elements of performance. DMB sshould upscale their investments in information and communication technology (ICT) infrastructure to enhance internal capacity to provide uninterrupted services, as well as develop capacity resolve customer complaints real-time.

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